



General

Guideline Title

ACR Appropriateness Criteria® pretreatment staging of colorectal cancer.

Bibliographic Source(s)

Dewhurst C, Rosen MP, Blake MA, Baker ME, Cash BD, Fidler JL, Greene FL, Hindman NM, Jones B, Katz DS, Lalani T, Miller FH, Small WC, Sudakoff GS, Tulchinsky M, Yaghmai V, Yee J, Expert Panel on Gastrointestinal Imaging. ACR Appropriateness Criteria® pretreatment staging of colorectal cancer. [online publication]. Reston (VA): American College of Radiology (ACR); 2011. 7 p. [62 references]

Guideline Status

Note: This guideline has been updated. The National Guideline Clearinghouse (NGC) is working to update this summary.

Recommendations

Major Recommendations

Note: This guideline has been updated. The National Guideline Clearinghouse (NGC) is working to update this summary. The recommendations that follow are based on the previous version of the guideline.

ACR Appropriateness Criteria®

Clinical Condition: Pretreatment Staging of Colorectal Cancer

Variant 1: Rectal cancer (small or superficial).

Radiologic Procedure	Rating	Comments	RRL*
US pelvis endorectal	8	For assessment of level of rectal wall involvement.	O
CT chest abdomen pelvis with contrast	8		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
X-ray chest	8	If chest CT is not performed.	<input type="text"/>
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative

Radiologic Procedure	Rating	Comments	RRL*
MRI pelvis without and with contrast	7	See statement regarding contrast in text under "Anticipated Exceptions."	O
MRI abdomen without and with contrast	6	See statement regarding contrast in text under "Anticipated Exceptions."	O
CT chest abdomen pelvis without contrast	5		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
CT chest abdomen pelvis without and with contrast	5		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
MRI pelvis without contrast	5		O
MRI abdomen without contrast	5		O
FDG-PET/CT whole body	5		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 2: Rectal cancer—large lesion.

Radiologic Procedure	Rating	Comments	RRL*
CT chest abdomen pelvis with contrast	8		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
FDG-PET/CT whole body	8	Has been shown to alter staging compared to CT. May be used in place of CT without PET.	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
X-ray chest	8	To evaluate for metastatic disease if chest CT is not performed.	<input type="text"/>
MRI pelvis without and with contrast	8	See statement regarding contrast in text under "Anticipated Exceptions."	O
MRI abdomen without and with contrast	7	See statement regarding contrast in text under "Anticipated Exceptions."	O
MRI pelvis without contrast	6		O
US pelvis endorectal	6		O
MRI abdomen without contrast	5		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation

Contrast Radiologic Procedure	Rating	Comments	RRL*
			<input type="text"/> <input type="text"/> <input type="text"/>
CT chest abdomen pelvis without and with contrast	5		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 3: Colon cancer (other than rectum).

Radiologic Procedure	Rating	Comments	RRL*
CT chest abdomen pelvis with contrast	8	To evaluate for synchronous lesions, CTC may be done in conjunction with CT of abdomen and pelvis.	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
X-ray chest	8	To evaluate for metastatic disease if chest is not imaged by CT.	<input type="text"/>
FDG-PET/CT whole body	7		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
MRI abdomen and pelvis without and with contrast	7	If CT is contraindicated or liver lesion requires further characterization. See statement regarding contrast in text under "Anticipated Exceptions."	O
MRI abdomen and pelvis without contrast	5		O
CT chest abdomen pelvis without and with contrast	5		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
CT chest abdomen pelvis without contrast	5		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

Colorectal cancers are the second most common tumors in the United States and the most common gastrointestinal cancer. The National Cancer Institute estimates that over 141,000 new cases of colorectal cancer will be diagnosed in 2011. Most of these patients undergo surgery for palliation or possible cure.

Colonic Malignancy

Barring contraindications from associated medical conditions, virtually all patients with colonic cancer will undergo some form of surgical therapy for attempted cure or palliation. The purpose of the preoperative imaging workup is directed at determining the presence or absence of synchronous carcinoma, additional adenomas, contiguous organ involvement, or distant metastases. Staging information also aids in comparing the effectiveness of different therapies.

Rectal Malignancy

The preoperative staging assessment of rectal carcinoma has significant therapeutic implications. Patients with node-negative rectal carcinomas that have not reached the serosa may be adequately treated by radiation therapy with or without transanal excision. Furthermore, clinical trials combining preoperative chemotherapy and radiation followed by primary resection have shown improved survival in patients who present with transmural invasion or who are lymph node positive. Thus preoperative imaging for local staging of rectal cancer is used routinely.

Imaging Modalities

Computed tomography (CT) scanning, magnetic resonance imaging (MRI), and transrectal ultrasound (TRUS) have all been extensively evaluated in initial staging of colorectal carcinoma. There are few initial therapeutic options for patients with colon carcinoma beyond surgery. Surgical excision with satisfactory margins is necessary to provide a significant disease-free interval. However, in rectal carcinoma, several other parameters can help determine the definitive treatment. Transanal excision has been shown to provide long-term survival equivalent to surgery in selected cases (i.e., node negative lesions without extension into the muscularis layer), and may carry a higher patient acceptance. Alternatively, in patients with transmural disease, preoperative radiation may improve survival. These decisions, however, cannot be made without accurate presurgical staging. Although reports suggest that MRI and TRUS may provide better methods than CT for staging rectal cancer, to date they have not been successful enough to be used routinely as the sole imaging modality.

Computed Tomography

Initially, CT was the first "staging" modality evaluated. Early enthusiastic reports of accuracy ranged between 85% and 90% and it was reported to be an excellent preoperative staging method with the ability to depict tumor and metastases. CT is still recommended in the initial evaluation of all patients scheduled for colorectal carcinoma surgery because of its ability to obtain a rapid global evaluation and demonstrate complications (perforation, obstruction, etc.) that may not be clinically apparent.

Larger, more carefully controlled studies, however, have shown that the overall accuracy of CT is in the 50% to 70% range, varying directly with the stage of the lesion (i.e., T4 lesions are more accurately assessed than T2 or T3 lesions). Overstaging is far more common, as it is difficult to accurately determine T-stage (depth of bowel wall penetration) on CT. Another complicating factor, particularly in rectal cancer, is that perirectal spiculation can be confused with desmoplastic peritumoral inflammation, which can also lead to overstaging.

There is little agreement on the critical cut-off diameter to determine if lymph nodes are involved in the disease process. One study suggests 4.5 mm; however, nodal size is not seen as a predictor of nodal status at surgery. Since detection of nodes involved with tumor remains a difficult problem, if a colonic resection is planned, local node groups are encompassed in a properly performed cancer operation. The specificity for detecting lymph nodes involved with tumor is only 45%.

Liver metastases are detected by CT with 85% accuracy and 97% specificity. Detection of liver metastases by CT improves as disease stage increases. Among a group of 100 patients who underwent CT, CT arteriography (CTAP), and MRI, the sensitivity and specificity for liver metastases were 73% and 96.5% for CT, 87.1% and 89.3% for CTAP and 81.9% and 93.2% for MRI. In addition, abdominal/pelvic CT has a high negative predictive value of 90%.

Detection of possible lung metastases is also an important part of the initial imaging evaluation of patients with colorectal carcinoma. Among patients with potentially resectable liver metastases and a negative initial chest radiograph, additional imaging with a chest CT revealed pulmonary metastases in only 5% of patients. However, one study showed that rectal cancer is more likely than colon cancer to present with lung metastases without liver metastases and that this risk increases with advancing T stage. Although this study advised CT imaging of the chest in all rectal cancer patients, it was limited by the lack of pathological correlation.

Virtual colonoscopy (or CT colonography [CTC]) has proven to be a valid tool in identifying both primary and synchronous colonic lesions and for detecting extracolonic metastases. CTC is beneficial after incomplete colonoscopy to evaluate the remainder of the colon and is currently being

advocated for use as a screening test. More than 95% of patients prefer CTC to routine colonoscopy, and its use may increase patient willingness to receive regular screening for colorectal cancer. CTC has a staging accuracy of 81% and has a sensitivity of 93% and a specificity of 97% for detecting polyps >1 cm. Sensitivity and specificity fall to 86% and 86%, respectively, for polyps measuring <1 cm.

Magnetic Resonance Imaging

Data from the Radiology Diagnostic Oncology Group (RDOG) study showed that MRI had an accuracy of 58% for detecting local staging of rectal cancer and was equal to CT for detecting colonic neoplasms. Accuracy in identification of lymph node metastases was similar to CT with a sensitivity of 85%, and MRI was slightly superior for detecting liver metastases.

Recently, several groups, using endorectal MR coils and 3.0T magnets, have shown impressive results in the depicting the layers of the rectal wall with resultant improvement in the accuracy of assessing the depth of bowel wall penetration. There is no consensus in the literature as to whether endorectal coils should be used routinely in practice. Some studies contend that endorectal coils provide improved diagnostic accuracy as compared to phased-array coils alone for T stage, with sensitivity reaching 100% and specificity of 86%. Endorectal coils have limitations in assessing upper rectal tumors and lateral pelvic and inferior mesenteric lymph nodes. Although phased array coils are far superior in detecting lymph node metastases, they are limited in the imaging of obese patients and in the evaluation of lower rectal tumors. With the advent of 3.0T imaging, most imaging can be performed with a pelvic phased-array coil only.

MRI can aid in the accurate prediction of a histologically involved circumferential resection margin with a reported sensitivity of 94% to 100%; and a specificity of 85% to 88%. The distance to the mesorectal fascia is an important prognostic factor for determining risk of local recurrence. MRI has an accuracy of 86% in predicting the circumferential margin involvement. Furthermore, from a surgical perspective, assessment of the mesorectal fascia involvement and tumor-free circumferential resection margin is crucial for surgical planning that determines whether total mesorectal excision (TME) or extended TME should be performed.

Diffusion-weighted imaging (DWI) has shown to be more sensitive and specific than standard contrast-enhanced MRI with gadolinium or superparamagnetic iron oxide (SPIO)-enhanced MRI, with values of 82% and 94%, respectively. It is believed to be superior for tumor detection and characterization and for monitoring tumor response. Adding DWI to conventional MRI yields better diagnostic accuracy than conventional MRI alone. DWI does not use contrast and is more sensitive than contrast-enhanced CT in detecting metastases. It also has the potential to be clinically effective for the evaluation of preoperative TNM staging and the postoperative follow-up of colorectal cancer.

Transrectal Ultrasound

TRUS has become the standard imaging procedure for staging rectal carcinoma. Because TRUS enables one to distinguish layers within the rectal wall, it is an accurate method for detecting depth of tumor penetration and perirectal spread. Reported sensitivities range between 83% and 97%. The T-stage accuracy for TRUS (84.6%) is far superior to that of CT (70.5%). However, overstaging can be a problem, especially when differentiating T2 from T3 lesions. TRUS however, is of value in assessing apparently superficial rectal carcinomas that are potentially suitable for treatment by transanal or local excision or endocavitary radiation.

One study compared the frontal US probe to the radial probe and found that the accuracy for T staging was 89% for the frontal but only 69% for the radial probe, with no overstaging seen with the radial probe.

Detection of lymph node involvement with TRUS is difficult. Sensitivity is 50% to 57%, and overall accuracy 62% to 83%. Although TRUS can frequently be used to detect regional lymph nodes, it has not been shown to be predictive of the histology of the visualized lymph nodes. Many lymph nodes measuring <5 mm in diameter have associated micrometastases, and some early-stage T1 and T2 tumors are likely to have lymph node micrometastases missed at TRUS. This may be responsible for the high rate of pelvic recurrence within this patient group.

Nuclear Medicine

Positron emission tomography (PET) and PET/CT have been shown to alter therapy in almost a third of patients with advanced primary rectal cancer. In a study comparing PET/CT with TRUS, MRI and helical CT in imaging patients with low rectal carcinoma, PET/CT identified discordant findings and was far superior in 38% of patients. The result was an upstaging in 50% of these patients and downstaging in 21%. A relatively new concept of PET/CTC has been reported to be significantly more accurate in defining TNM stage than CTC alone. However, it is not used routinely in most centers. The accuracy of PET/CT is similar to that of CT in terms of T stage but is far superior in detecting hepatic and peritoneal metastases (sensitivity of 89% and specificity of 64%). The sensitivity of detecting nodal metastases is only 43% with a specificity of 80%, and again size is not a helpful characteristic.

There is also a potential role for PET in restaging colorectal cancer after chemoradiotherapy by measuring the pretreatment and post-treatment standard uptake volume (SUV) and assessing response by decreasing SUV. Limitations of PET include decreased sensitivity in detecting small colonic lesions 5-10 mm in diameter and decreased 18F-fluorodeoxyglucose (FDG) uptake by mucinous tumors.

Summary

- The preoperative staging assessment of rectal carcinoma has significant therapeutic implications in terms of surgical planning and neoadjuvant chemotherapy and radiation therapy.
- CT of the chest, abdomen, and pelvis is recommended in the initial evaluation of all patients scheduled for colorectal carcinoma surgery.
- TRUS enables one to distinguish layers within the rectal wall. It is an accurate method for detecting depth of tumor penetration and perirectal spread. However, it is associated with overstaging and is not fully accurate in differentiating T2 from T3 lesions.
- CTC is a valid tool for identifying both primary and synchronous colonic lesions and for detecting extracolonic metastases.
- The sensitivity and specificity of endorectal MRI for predicting circumferential margin involvement are 94% and 85%, respectively. No consensus is seen in the literature as to whether endorectal coil or phased-array coil should be used routinely, as both have limitations.
- DWI has shown to be more sensitive and specific than standard contrast-enhanced MRI with gadolinium contrast.

Anticipated Exceptions

Nephrogenic systemic fibrosis (NSF) is a disorder with a scleroderma-like presentation and a spectrum of manifestations that can range from limited clinical sequelae to fatality. It appears to be related to both underlying severe renal dysfunction and the administration of gadolinium-based contrast agents. It has occurred primarily in patients on dialysis, rarely in patients with very limited glomerular filtration rate (GFR) (i.e., <30 mL/min/1.73 m²), and almost never in other patients. There is growing literature regarding NSF. Although some controversy and lack of clarity remain, there is a consensus that it is advisable to avoid all gadolinium-based contrast agents in dialysis-dependent patients unless the possible benefits clearly outweigh the risk, and to limit the type and amount in patients with estimated GFR rates <30 mL/min/1.73 m². For more information, please see the American College of Radiology (ACR) Manual on Contrast Media (see the "Availability of Companion Documents" field).

Abbreviations

- CT, computed tomography
- CTC, CT colonography
- FDG-PET, 18F-fluorodeoxyglucose-positron emission tomography
- MRI, magnetic resonance imaging
- US, ultrasound

Relative Radiation Level Designations

Relative Radiation Level*	Adult Effective Dose Estimate Range	Pediatric Effective Dose Estimate Range
O	0 mSv	0 mSv
<input type="text"/>	<0.1 mSv	<0.03 mSv
<input type="text"/> <input type="text"/>	0.1-1 mSv	0.03-0.3 mSv
<input type="text"/> <input type="text"/> <input type="text"/>	1-10 mSv	0.3-3 mSv
<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	10-30 mSv	3-10 mSv
<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	30-100 mSv	10-30 mSv
*RRL assignments for some of the examinations cannot be made, because the actual patient doses in these procedures vary as a function of a number of factors (e.g., region of the body exposed to ionizing radiation, the imaging guidance that is used). The RRLs for these examinations are designated as NS (not specified).		

Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

Scope

Disease/Condition(s)

Colorectal cancer

Guideline Category

Evaluation

Clinical Specialty

Colon and Rectal Surgery

Gastroenterology

Internal Medicine

Nuclear Medicine

Oncology

Radiology

Intended Users

Health Plans

Hospitals

Managed Care Organizations

Physicians

Utilization Management

Guideline Objective(s)

To evaluate the appropriateness of initial radiologic examinations for pretreatment staging of colorectal cancer

Target Population

Patients with colorectal cancer

Interventions and Practices Considered

1. Ultrasound (US), pelvis, endorectal
2. X-ray, chest
3. Computed tomography (CT), chest, abdomen and pelvis, with contrast, without contrast, or without and with contrast
4. Magnetic resonance imaging (MRI)
 - Abdomen, without contrast or without and with contrast
 - Pelvis, without contrast or without and with contrast
 - Abdomen and pelvis, without contrast or without and with contrast
5. Fluorodeoxyglucose–positron emission tomography (FDG-PET)/CT whole body

Major Outcomes Considered

Utility of radiologic examinations in pretreatment staging of colorectal cancer

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search Procedure

The Medline literature search is based on keywords provided by the topic author. The two general classes of keywords are those related to the condition (e.g., ankle pain, fever) and those that describe the diagnostic or therapeutic intervention of interest (e.g., mammography, MRI).

The search terms and parameters are manipulated to produce the most relevant, current evidence to address the American College of Radiology Appropriateness Criteria (ACR AC) topic being reviewed or developed. Combining the clinical conditions and diagnostic modalities or therapeutic procedures narrows the search to be relevant to the topic. Exploding the term "diagnostic imaging" captures relevant results for diagnostic topics.

The following criteria/limits are used in the searches.

1. Articles that have abstracts available and are concerned with humans.
2. Restrict the search to the year prior to the last topic update or in some cases the author of the topic may specify which year range to use in the search. For new topics, the year range is restricted to the last 5 years unless the topic author provides other instructions.
3. May restrict the search to Adults only or Pediatrics only.
4. Articles consisting of only summaries or case reports are often excluded from final results.

The search strategy may be revised to improve the output as needed.

Number of Source Documents

The total number of source documents identified as the result of the literature search is not known.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Strength of Evidence Key

Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis, and results.

Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.

Category 3 - The conclusions of the study may be valid, but the evidence supporting the conclusions is inconclusive or equivocal.

Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.

Methods Used to Analyze the Evidence

Description of the Methods Used to Analyze the Evidence

The topic author drafts or revises the narrative text summarizing the evidence found in the literature. American College of Radiology (ACR) staff draft an evidence table based on the analysis of the selected literature. These tables rate the strength of the evidence for all articles included in the narrative text.

The expert panel reviews the narrative text, evidence table, and the supporting literature for each of the topic-variant combinations and assigns an appropriateness rating for each procedure listed in the table. Each individual panel member forms his/her own opinion based on his/her interpretation of the available evidence.

More information about the evidence table development process can be found in the ACR Appropriateness Criteria® Evidence Table Development document (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

Modified Delphi Technique

The appropriateness ratings for each of the procedures included in the Appropriateness Criteria topics are determined using a modified Delphi methodology. A series of surveys are conducted to elicit each panelist's expert interpretation of the evidence, based on the available data, regarding the appropriateness of an imaging or therapeutic procedure for a specific clinical scenario. American College of Radiology (ACR) staff distributes surveys to the panelists along with the evidence table and narrative. Each panelist interprets the available evidence and rates each procedure. The surveys are completed by panelists without consulting other panelists. The ratings are a scale between 1 and 9, which is further divided into three categories: 1, 2, or 3 is defined as "usually not appropriate"; 4, 5, or 6 is defined as "may be appropriate"; and 7, 8, or 9 is defined as "usually appropriate." Each panel member assigns one rating for each procedure per survey round. The surveys are collected and the results are tabulated, de-identified and redistributed after each round. A maximum of three rounds are conducted. The modified Delphi technique enables each panelist to express individual interpretations of the evidence and his or her expert opinion without excessive bias from fellow panelists in a simple, standardized and economical process.

Consensus among the panel members must be achieved to determine the final rating for each procedure. Consensus is defined as eighty percent (80%) agreement within a rating category. The final rating is determined by the median of all the ratings once consensus has been reached. Up to three rating rounds are conducted to achieve consensus.

If consensus is not reached, the panel is convened by conference call. The strengths and weaknesses of each imaging procedure that has not reached consensus are discussed and a final rating is proposed. If the panelists on the call agree, the rating is accepted as the panel's consensus. The document is circulated to all the panelists to make the final determination. If consensus cannot be reached on the call or when the document is circulated, "No consensus" appears in the rating column and the reasons for this decision are added to the comment sections.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The recommendations are based on analysis of the current literature and expert panel consensus.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Selection of appropriate radiologic imaging procedures for pretreatment staging of colorectal cancer

Potential Harms

Gadolinium-Based Contrast Agents

Nephrogenic systemic fibrosis (NSF) is a disorder with a scleroderma-like presentation and a spectrum of manifestations that can range from limited clinical sequelae to fatality. It appears to be related to both underlying severe renal dysfunction and the administration of gadolinium-based contrast agents. It has occurred primarily in patients on dialysis, rarely in patients with very limited glomerular filtration rate (GFR) (i.e., <30 mL/min/1.73 m²), and almost never in other patients. Although some controversy and lack of clarity remain, there is a consensus that it is advisable to avoid all gadolinium-based contrast agents in dialysis-dependent patients unless the possible benefits clearly outweigh the risk, and to limit the type and amount in patients with estimated GFR rates <30 mL/min/1.73 m². For more information, please see the American College of Radiology (ACR) Manual on Contrast Media (see the "Availability of Companion Documents" field).

Relative Radiation Level (RRL)

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Patients in the pediatric age group are at inherently higher risk from exposure, both because of organ sensitivity and longer life expectancy (relevant to the long latency that appears to accompany radiation exposure). For these reasons, the RRL dose estimate ranges for pediatric examinations are lower as compared to those specified for adults. Additional information regarding radiation dose assessment for imaging examinations can be found in the ACR Appropriateness Criteria® Radiation Dose Assessment Introduction document (see the "Availability of Companion Documents" field).

Qualifying Statements

Qualifying Statements

The American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists,

radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those examinations generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Dewhurst C, Rosen MP, Blake MA, Baker ME, Cash BD, Fidler JL, Greene FL, Hindman NM, Jones B, Katz DS, Lalani T, Miller FH, Small WC, Sudakoff GS, Tulchinsky M, Yaghmai V, Yee J, Expert Panel on Gastrointestinal Imaging. ACR Appropriateness Criteria® pretreatment staging of colorectal cancer. [online publication]. Reston (VA): American College of Radiology (ACR); 2011. 7 p. [62 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

1996 (revised 2011)

Guideline Developer(s)

American College of Radiology - Medical Specialty Society

Source(s) of Funding

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

Guideline Committee

Committee on Appropriateness Criteria, Expert Panel on Gastrointestinal Imaging

Composition of Group That Authored the Guideline

Panel Members: Catherine Dewhurst, MD (*Research Author*); Max P. Rosen, MD, MPH (*Principal Author and Panel Chair*); Michael A. Blake, MB, BCh (*Panel Vice-chair*); Mark E. Baker, MD; Brooks D. Cash, MD; Jeff L. Fidler, MD; Frederick L. Greene, MD; Nicole M. Hindman, MD; Bronwyn Jones, MD; Douglas S. Katz, MD; Tasneem Lalani, MD; Frank H. Miller, MD; William C. Small, MD, PhD; Gary S. Sudakoff, MD; Mark Tulchinsky, MD; Vahid Yaghmai, MD, MS; Judy Yee, MD

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

Note: This guideline has been updated. The National Guideline Clearinghouse (NGC) is working to update this summary.

Guideline Availability

Electronic copies of the updated guideline: Available from the [American College of Radiology \(ACR\) Web site](#) .

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

Availability of Companion Documents

The following are available:

- ACR Appropriateness Criteria®. Overview. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the [American College of Radiology \(ACR\) Web site](#) .
- ACR Appropriateness Criteria®. Literature search process. Reston (VA): American College of Radiology; 1 p. Electronic copies: Available in Portable Document Format (PDF) from the [ACR Web site](#) .
- ACR Appropriateness Criteria®. Evidence table development – diagnostic studies. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available in PDF from the [ACR Web site](#) .
- ACR Appropriateness Criteria®. Radiation dose assessment introduction. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the [ACR Web site](#) .
- ACR Appropriateness Criteria® Manual on contrast media. Reston (VA): American College of Radiology; 90 p. Electronic copies: Available in PDF from the [ACR Web site](#) .
- ACR Appropriateness Criteria® pretreatment staging of colorectal cancer. Evidence table. Reston (VA): American College of Radiology; 2011. 17 p. Electronic copies: Available from the [ACR Web site](#) .

Patient Resources

None available

NGC Status

This summary was completed by ECRI on March 19, 2001. The information was verified by the guideline developer on March 29, 2001. This summary was updated by ECRI Institute on June 23, 2009. This summary was updated by ECRI Institute on January 13, 2011 following the U.S. Food and Drug Administration (FDA) advisory on gadolinium-based contrast agents. This summary was updated by ECRI Institute on February 22, 2012.

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